United States Patent and Trademark Office

Examiner: Jeffrey R. West Art Unit: 2857 Docket No. 3804

In re:

Applicant: Tobias Lang

Serial No.: 10/591,897

Filed: September 7, 2006

APPEAL BRIEF

7/14/2008

Hon. Commissioner of
Patents and Trademark
PO Box 1450
Alexandria, VA 22313-1450

Sirs:

Appellant submits the following for his brief on appeal and respectfully requests consideration of same. Appellant requests withdrawal of the rejections made and that the Application be placed in line for Allowance.

I. REAL PARTY IN INTEREST

The real party in interest in the instant application is the assignee of the application, Robert Bosch GmbH, Stuttgart, Germany.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals or interferences with regard to the application.

III. STATUS OF CLAIMS

Claims 1, 2 and 4-8 are rejected. Claims 3 and 9 were canceled. Claims 1, 2 and 4-8 are appealed.

IV. STATUS OF AMENDMENTS

A Final Office Action finally rejecting claims 1, 2 and 4-8 was mailed on January 9, 2008. A Request for Reconsideration was submitted on April 9, 2008, in which only further arguments as to the patentability of claims 1, 2 and 4-8 were presented. An Advisory Action was mailed April 29, 2008, in which the rejection of claims 1, 2 and 4-8 was maintained. Appellant filed his Notice of Appeal on May 28, 2008.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 defines an ultrasonic flow sensor, comprising the following elements:

at least one ultrasonic transducer for transmitting and receiving ultrasonic signals, and

a receiver unit (4) connected to the ultrasonic transducer that detects a predetermined event (N) of the ultrasonic signal as a reception time (t_0), wherein the receiver unit (4) determines a time (t_1) of a value characteristic of the ultrasonic signal as well as a time shift (Δt) of the time (t_1) relative to the reception time (t_0) and uses the time shift (Δt) to determine a correct time value for the reception time (t_0),

wherein the receiver unit (4) determines a chronological position (T_s) of a focal point of either the ultrasonic signal or its envelope curve (6) as the characteristic value.

Claim 7 defines a method for detection of an ultrasonic signal in an ultrasonic transducer:

by means of a receiver unit (4), which detects a predetermined event (N) of the ultrasonic signal as a reception time (t_0),

wherein the receiver unit (4) determines a time (t_1) of a value characteristic of the ultrasonic signal and determines a time shift (Δt) of the time (t_1) in relation to the reception time (t_0) and uses the time shift (Δt) to determine a correct time value for the reception time (t_0),

wherein the receiver unit (4) determines a chronological position of a focal point of the ultrasonic signal or its envelope curve (6) as a characteristic value.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1, 2 and 4-8 are unpatentable under 35 U.S.C. §103(a) over Applicant's admitted prior art (AAPA) in view of Japanese Patent Application Publication No. 2003-050145 to Eshita, et al. ("Eshita").

VII. ARGUMENT

Claims 1, 2 and 4-8 are patentable over AAPA in view of Eshita

In the final rejection, the Examiner argues with respect to claims 1 and 7 that AAPA comprises an ultrasonic flow sensor including at least one ultrasonic transducer for transmitting and receiving ultrasonic signals and a receiver unit (or means) that is connected to the ultrasonic transducer and detects a predetermined event of the ultrasonic signal at reception time, wherein the receiver unit is embodied in such a way that it determines the time of a value characteristic of the ultrasonic signal, that AAPA discloses determining a reception as claimed, and a time value of a characteristic value of same ultrasonic signal.

The Examiner asserts that AAPA does not teach or suggest correcting the reception time by detecting a time shift between the reception time and time of the characteristic value, but that Eshita includes two comparison circuits and logic for comparing a reception time and characteristic value of the signal, and that Eshita determines a time shift between the reception time and characteristic value (paragraph [0027], line 1, to paragraph [0028], line 10]), for the received

signal, and corrects the reception time as a function of a time shift (paragraph [0032]). The Examiner concludes that it would have been obvious to modify AAPA with Eshita to include Eshita's correcting the reception time as a function of the time shift.

In the Advisory Action, the Examiner further qualifies the statements made in the Final Office Action by stating that Eshita's time shift is a time shift between the reception and time of the characteristic value, that Eshita suggests the feature would improve AAPA enabling it to detect reception accurately, maintaining the rejection of claims 1, 2 and 4-8.

Appellant respectfully disagrees with this statement and analysis. Eshita is fundamentally different from appellant's invention, as claimed. Neither Eshita nor AAPA teach or suggest the feature of detecting a predetermined event (N) of the ultrasonic signal as a reception time (t_0), determining a time (t_1) of a value characteristic of the ultrasonic signal, a time shift (Δt) of the time (t_1) relative to the reception time (t_0), and using the time shift (Δt) to determine a correct time value for the reception time (t_0) using a chronological position (T_s) of a focal point of either the ultrasonic signal or its envelope curve (6) as the characteristic value.

In appellant's ultrasonic flow sensor, as claimed, at least one ultrasonic transducer transmits and receives ultrasonic signals (Figs. 3, 4 and 6), where the Fig. 2 receiver unit (4) detects a predetermined event (N) of the ultrasonic signal as a reception time (t_0), a time (t_1) of a value characteristic and a time shift (Δt) of the time (t_1) relative to the reception time (t_0). The receiver uses the time shift (Δt) and the characteristic value to determine a correct time value for the

reception time (t_0). The characteristic value is a chronological position (T_s) of a focal point of either the ultrasonic signal (A0, B0) or its envelope curve (6).

The claimed receiver unit also determines the t_0 of the maximum signal amplitude Amp_{max}, and time difference Δt between reception time t_0 and the time of the maximum signal amplitude t_1. As shown in Fig. 4, with a sharp change in the signal amplitude, an incorrect zero crossing is detected because the time difference Δt changes abruptly (Specification at page 6, lines 10-27). Such error is detected and corrected using Δt. The receiver first derives a time t_1 of a value characteristic of the ultrasonic signal, the time shift Δt of time t_1 relative to reception time to.

The envelope curve focal point Ts (Fig. 6) of the ultrasonic signal (A0, B0) is used as the characteristic value set in relation to reception time t_0. The chronological focal point Ts of envelope 6 of a signal is determined, and the time difference Δt from t_0 to same chronological focal point. Fig. 7 shows the curve of the single focal point Ts as a function of the ratio of the threshold voltage Usw to signal amplitude Amp (Fig. 6). Whenever the amplitude Amp of the ultrasonic signal changes so intensely that the threshold USW is exceeded one signal period earlier or later, then a jump occurs in the signal Ts. **[page 7, lines 14-17; lines 23-27; and page 8, lines 5-9].**

Eshita discloses ultrasonic flow-velocity measurement using a pair of transducers located upstream and downstream with respect to a flow point at which flow is to be measured, and comparing reception of signals generated at

the upstream and downstream locations. The time difference in the reception of the two signals is used to determine the rate of flow.

To do so, Eshita detects reception and a count or time to a maximum amplitude relative to reception. Eshita detects the maximum envelope amplitude while counting from reception time, and uses the difference as a time shift value. Eshita discloses counting zero crossings from reception to the zero crossings at a pulse envelope peak of each signal for use as a time shift value, but does not determine a correct time value for the reception time, as claimed.

Eshita at paragraph [0027] through line 10 of paragraph [0028] discloses determining a time shift between launch time using a clock wave, etc., to reception time as a propagation time, or time of flight, and the propagation time and time of flight in the reverse direction. Eshita at paragraph [0032] discloses that the time shift can be modified by adding or subtracting time.

Eshita does not determine the chronological position Ts of the focal point of either the ultrasonic signal or its envelope (6), using it as a characteristic value, determining a time t_1 of the characteristic value and a time shift Δt of t_1 relative t_0, using Δt to determine a correct time value of the reception time t_0, as claimed.

Appellant respectfully asserts that it should be clear that Eshita does not disclose the above-described flow sensor and method that uses a time t_1 of a characteristic value and a time shift Δt of time t_1 relative to reception time t_0 to determine a correct time value for the reception time, and determining the chronological position Ts of a focal point of either the ultrasonic signal or its

envelope (6) as the characteristic value. This claimed feature is not disclosed in AAPA, as well. Therefore, there is no hint or suggestion why a person of ordinary skill in the art, who might have familiarized him/herself with the teaching of AAPA, and used the patent to Eshita, would come to the new feature of the present invention, which is defined in claims 1 and 7.

In order to arrive at appellant's invention from the combination of the references proposed by the Examiner, it is not enough just to combine the references, but instead the references have to be fundamentally modified by including into them the new features of the present invention, which are now defined in claims 1 and 7. However, it is known that in order to arrive at a claimed invention, by modifying the references cited art must itself contain a suggestion or reason for such a modification.

This principle has been consistently upheld by the U.S. Court of Customs and Patent Appeals which, for example, held in its decision in re Randol and Redford (165 USPQ 586) that

> Prior patents are references only for what they clearly disclose or suggestion; it is not a proper use of a patent as a reference to modify its structural to one which prior art references do not suggest.

It is respectfully submitted that since the prior art does not suggest the desirability of the claimed invention, such art cannot establish a prima facie case of obviousness as clearly set forth in MPEP section 2143.01. When establishing obviousness under Section 103, it is not pertinent whether the prior art device possess the functional characteristics of the claimed invention, if the reference

does not describe or suggest its structure. ***In re Mills***, 16 USPQ 2d 1430, 1432-33 (Fed. Cir. 1990).

Therefore, claim 1 is patentable over the combination of AAPA and Eshita. Because claims 1 and 7 are patentable, dependent claims 2, 4-6 and 8 also are patentable for the same reasons as set forth above.

In view of the foregoing discussion, it is respectfully requested that the Honorable Board of Patent Appeals and Interferences overrule the final rejection of claims 1, 2 and 4-8 over the cited art, and hold that Appellant's claims be allowable over such art.

Respectfully Submitted,

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VIII. CLAIMS APPENDIX

Copy of Claims Involved in the Appeal:

1. An ultrasonic flow sensor, comprising

– at least one ultrasonic transducer for transmitting and receiving ultrasonic signals, and

– a receiver unit (4) connected to the ultrasonic transducer that detects a predetermined event (N) of the ultrasonic signal as a reception time (t_0), wherein the receiver unit (4) determines a time (t_1) of a value characteristic of the ultrasonic signal as well as a time shift (Δt) of the time (t_1) relative to the reception time (t_0) and uses the time shift (Δt) to determine a correct time value for the reception time $(t_0)_\perp$

wherein the receiver unit (4) determines a chronological position (T_s) of a focal point of either the ultrasonic signal or its envelope curve (6) as the characteristic value.

2. The ultrasonic flow sensor as recited in claim 1,

wherein the receiver unit (4) determines a maximum amplitude (Amp_{max}) of the ultrasonic signal as a characteristic value.

3. (cancelled)

4. The ultrasonic flow sensor as recited in claim 1,

wherein the receiver unit (4) includes a comparator (10) whose input is supplied with a transducer output signal (5) and a reference signal (SW), and the receiver unit (4) determines a piece of information about the time (t_1) of the characteristic value from an output signal of the comparator (10).

5. The ultrasonic flow sensor as recited in claim 4,

wherein the reference signal supplied to the comparator (10) is a threshold (SW) not equal to zero and the output signal of the comparator (10) is a pulse width modulated signal (K1) from which the time (t_1) of the characteristic value is determined.

6. The ultrasonic flow sensor as recited in claim 1,

wherein the reception time (t_0) is corrected as a function of the time shift (Δt).

7. A method for detection of an ultrasonic signal (A0, B0) in an ultrasonic transducer by means of a receiver unit (4), which detects a predetermined event (N) of the ultrasonic signal as a reception time (t_0),

wherein the receiver unit (4) determines a time (t_1) of a value characteristic of the ultrasonic signal and determines a time shift (Δt) of the time (t_1) in relation to the reception time (t_0) and uses the time shift (Δt) to determine a correct time value for the reception time (t_0),

wherein the receiver unit (4) determines a chronological position of a focal point of the ultrasonic signal or its envelope curve (6) as a characteristic value.

8. The method as recited in claim 7,

wherein the receiver unit (4) determines a maximum amplitude (Amp_{max}) of the ultrasonic signal as a characteristic value.

9. (cancelled)

IX. EVIDENCE APPENDIX.

None.

X. RELATED PROCEEDINGS APPENDIX.

None.